Studies in Oxybeline Wasps (Sphecidae, Hymen.).

I. Enchemicrum, an Annectant between Belomicrus and Oxybelus.

By V. S. L. Pate, Cornell University.

ENCHEMICRUM gen. nov.

(ἔγχος, τὸ, spear + μικρός, small)

Head as wide as, or wider than, the thorax. Face moderately wide. Eyes reaching the bases of the mandibles, moderately divergent above and below, with dorsal and posterior facets smaller than anterior ventral ones. Ocelli arranged in a low isosceles triangle; posterior pair nearer the compound eyes than each other; an oblique impression between the lateral ocelli and the compound eyes. Mandibles acute at apex, with a blunt tooth at about the middle of the inner margin and, in the male, excised at the middle of the outer margin. Median area of clypeus more or less produced in the male. Antennae 13-jointed in the male, 12-jointed in the female, inserted just above the posterior margin of the clypeus and about as far from each other as they are from the eyes; flagellum short, joints, except the last, about as wide as long. Face more or less flat, with two smooth impressions on the lower half to accommodate the scapes when laid back. Temples wide above, rapidly narrowing below. Occipital carina wanting.

Thorax moderately stout. Pronotum short, linear, nearly level with the mesonotum, its anterior face vertical. Mesopleurum with a well defined epicnemium (prepectus) and without a distinct crest or ridge before the middle coxae. Scutellum and postscutellum without a median longitudinal carina. Postscutellum produced on the hind margin into membranous lamellae. Dorsum of propodeum with a small straight mucro or median process below which is a well defined enclosed median area.

Abdomen ovate, widest at second segment. First and second tergites subcarinate along the edge of the dorso-ventral fold, but not sharply flexed as in *Belomicrus;* sternites not flat. Tergites without lateral teeth in the ♂. Pygidial area defined in both sexes, triangular in the ♀, more or less trapezoidal in the ♂.

Wings: Stigma distinct. Forewing with radial cell broadly truncate at apex, and with distinct appendiculate cell; first cubital and first discoidal cells confluent, separated at most by a *vena spuria.*

Legs moderately spinose. Middle and hind tibiae with three

rows of spines; middle tibiae with one spur apically. Middle coxae far apart and sunk into the sternum. Tarsal comb weakly developed in the ♀, quite rudimentary in the ♂. Last joint of tarsi moderately swollen; pulvillus large; claws unarmed.

Puncturation of body similar to *Belomicrus*, much finer than *Oxybelus*.

Genotype: Enchemicrum australe sp. nov.

Enchemicrum australe sp. nov.

♂. 4.5 mm. long. Black. Mandibles lemon yellow, apex red. Scapes yellow with a black line internally; flagellum black becoming rufous apically. Tarsi, anterior and middle tibiae, posterior tibiae externally, anterior and middle femora beneath, posterior femora at apex, pronotum with tubercles, and postscutellum stramineous. First and second abdominal tergites with broad yellow bands laterally, those of the first segment twice the size of the second; last two segments rufous. Tegulae, squamae, tip of mucro, and posterior margins of abdominal tergites and sternites subhyaline.

Front and clypeus clothed with short appressed silvery pubescence; thorax, abdomen and legs sparsely clothed with quite short silver hairs.

Head finely but distinctly punctured; occiput striato-punctate. Medially produced portion of clypeus tridentate; front slightly crested medially and with a shallow sulcus on each side parallel to the inner orbits of the compound eyes; anterior ocellus situated in a shallow fossa.

Thorax with puncturation similar to that of head. Pronotum transversely carinate anteriorly and with a median longitudinal sulcus. Mesonotum with a very fine double stria on the anterior two-fifths. Squamae linear, without lateral or terminal points. Epicnemium and mesepisterna carinate anteriorly; metapleura with oblique rugae. Mucro short, straight, scarcely exceeding the level of the squamae, canaliculate anteriorly and dorsally, apex acute. Propodeum with oblique rugae and reticulations above; median area wedge-shaped, shining within; lateral areas finely punctured and with a few transverse rugae; lateral faces shining, finely punctured and with very fine oblique striae.

Abdomen shining, with fine well separated punctures; without any indication of lateral spines; last tergite (pygidium) emarginate apically; sternites each with a low, rounded, polished ridge preapically.

Wings hyaline, nervures testaceous.

Legs with calcaria of hind tibiae at least three-fourths the length of the hind metatarsi.

♀. 5.4 mm. long. Differs from ♂ as follows: Scape of antennae yellow apically only; maculations of abdomen smaller; only last segment of abdomen rufous. Clypeus with a polished, impunctate bevel; truncate apically, lateral angles prominent, median area gently curved, anteriorly with a rounded protuberance. Mandibles not excised externally, at most shallowly sinuate.

Holotype.—♂, Tulsa, OKLAHOMA. July 18 (J. C. Bradley) [Cornell University, Type no. 944.1]. *Allotype.*—♀, Tulsa, OKLAHOMA. July 18 (J. C. Bradley) [Cornell University, Type no. 944.2]. *Paratypes:* OKLAHOMA—2 ♂♂, Tulsa, July 18 (J. C. B.) [C. U., no. 944.3-944.4]. LOUISIANA—1 ♀, Darrow, June 19 (Jos. Bequaert) [C. U., no. 944.6]; 2 ♂♂, Logansport, June 1 (J. C. B.) [C. U., no. 944.7-944.8]. TEXAS —1♀, Feodor, July 6 (Birkmann) [Academy of Natural Sciences of Philadelphia]; 1 ♂, Galveston, May 30 (J. C. B.) [C. U., no. 944.5]; 2 ♂♂, Richmond, Brazos River, June 22 (J. C. B.) [C. U., no. 944.9-944.10]. ARIZONA—1 ♂, San Suor (sic!), July 14 (J. C. B.) [C. U., no. 944.11]. ALABAMA—6 ♂♂, Burkville, June 10 (J. C. B.) [C. U., no. 944.12-944.17].

All specimens were apparently caught on low ground in the near vicinity of streams. The specimens from Burkville, Ala., and Richmond, Tex., have the maculations cyanided.

Enchemicrum is an annectant between *Belomicrus* Costa and *Oxybelus* Latr. Its affinities with Belomicrus are evidenced by the fine puncturation of the body, the armature of the postscutellum and propodeum, the impressed ocular-ocellar groove and the absence of a distinct crest or ridge on the mesepisterna before the middle coxae. Were it not for the well developed squamae and mucro, the presence of a well defined, enclosed median area on the propodeum and the tarsal comb, *australe* might be considered a New World representative of that interesting Æthiopian subgenus, *Brimoclus* Arnold.

Until further material is forthcoming, the following key will serve to separate the Nearctic genera of Oxybeline wasps:

1. Tergites 1-5 (and 6 in the ♂) abruptly flexed under at the sides, so that the ventral and dorsal portions of the

tergites form a sharp edge at their junction; the sternites are flat. Last tarsal joint not swollen. Appendiculate cell of the forewing, if present, very small, so that the radial cell appears lanceolate or acute at apex ..... *Belomicrus* Costa.

Tergites not sharply flexed under at the sides; the sternites are convex. Last tarsal joint swollen. Appendiculate cell of the forewing wide so that the radial cell is truncate at apex ..... (2)

2. Mesepisternum with a precoxal carina; scutellum and postscutellum longitudinally carinate in the middle; puncturation of body coarse ..... *Oxybelus* Latreille.

Mesepisternum without a precoxal carina; scutellum and postscutellum not carinate; puncturation of body fine *Enchemicrum* Pate.

A Method for Rearing Mushroom Insects and Mites.*

By C. A. Thomas, Pennsylvania State College.

While conducting studies on the biology and control of insects and mites affecting cultivated mushrooms, it was necessary to rear large numbers of these pests. Various rearing methods were tried, including the use of soil in salve boxes, manure in vials, etc., but none was found more satisfactory than the following.

The insects and mites were obtained in as pure a culture as possible. They were then introduced in small numbers into fresh one-quart bottles of commercial mushroom spawn, and allowed to breed and develop. This spawn is made of chopped straw and manure thoroughly mixed, sterilized in an autoclave, and later inoculated with mushroom mycelium, grown from spores. With incubation at room temperature, the mycelium penetrates to the bottom of the bottles and completely fills the interstices of the medium. This spawn is thus pure-culture and is uncontaminated with molds.

It is very important that the flies and springtails to be reared should be free from mites, the hypopi of which are often carried on their bodies. Otherwise the mites may breed so rapidly as to destroy the mycelium and perhaps starve the insects.

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